A CITIZEN'S GUIDE TO ACHIEVING A HEALTHY COMMUNITY, ECONOMY & ENVIRONMENT

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The Citizen's Guide is a truly collaborative project, bringing together the lessons learned, expertise and great ideas of a wide spectrum of conservation professionals, economists, economic and community development specialists, community planners and educators.

The Nature Conservancy's Center for Compatible Economic Development developed and produced the guide with significant support from the U.S. Environmental Protection Agency's Office of Sustainable Ecosystems and Communities. The guide also has been adapted for specific states and regions, including Virginia and Colorado.

Greg Low developed the concept and wrote the text. Megan Gallagher edited the text and wrote the case studies. Lost Mountain Graphics of Middleburg, Virginia designed the handbook.

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that we can achieve a sustainable community, economy and environment, in particular:

-- The Nature Conservancy's bioreserve programs at the Virginia Eastern Shore, the Clinch Valley of southwestern Virginia and the ACE Basin in South Carolina;

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-- EPA's Office of Sustainable Ecosystems and Communities;

-- The Corporation for Enterprise Development, the Sonoran Institute, the Aspen Institute Rural Economic Policy Program and the President's Council on Sustainable Development.

The guide is a work in progress and has been substantially modified based on the good suggestions of many people. We welcome further recommendations for improvement.

INTRODUCTION: ACHIEVING A HEALTHY COMMUNITY, ECONOMY & ENVIRONMENT

Most people say that they want to live in a place with a vibrant community, a vigorous economy and a healthy environment. But we have generally pursued each of these goals independently of the others.

As a consequence, we sometimes find ourselves saying that to achieve one goal, we must give up on another. We say jobs must come at the cost of the environment or that economic competitiveness must be sacrificed to ensure community stability.

In fact, we must pursue all three goals together. A single-minded approach can no longer be the standard if we expect to extend our quality of life beyond the next fiscal quarter or if we intend to build a society that can offer quality of life to our children.

Over the long run, a successful society is supported by both a healthy economy and a healthy environment, which are both supported by the health of the community. Each goal is one critical leg that supports a three-legged stool. All three legs of the

stool must be strong. Remove any of the three legs and the stool will soon collapse.

We at The Nature Conservancy's Center for Compatible Economic Development started with a commitment to conservation. We developed our understanding of and commitment to community and economy because we became convinced that conservation goals could not be securely attained otherwise.

We realized that long-term conservation of significant natural environments will succeed only with strong support from the people who live and work in these areas. Economic development is vitally important to these communities, but inappropriate development often presents serious threats to the local environment.

We learned that examples of development that protect the environment, generate profits and enhance quality of life are rare. Therefore, we decided that we must work to foster successful, locally-based compatible development initiatives. The Citizen's Guide is one step toward that goal.

The Citizen's Guide is designed to help local people face the challenge of building a better three legged stool -- one that supports a prosperous society on the foundation of a healthy local community, economy and environment. It seeks to demonstrate that we can improve the quality of life in our communities by focusing on our local assets -- the people, natural resources, ecological systems, small businesses, products and processes, culture and heritage unique to the places where we live. The guide is based on science, common sense and our collective personal experience.

The Citizen's Guide outlines the basic principles of community development, economic development and environmental protection. It is intended to serve as a starting point for understanding the three legs of the stool that supports a healthy society. It is not intended to serve as a comprehensive guide to these subjects (more detailed reference sources are provided in the appendix). However, the guide does provide some ideas for taking introductory actions and does address in some detail the characteristics of compatible economic development.

We hope that citizen leaders, public officials and the members and staff of local groups concerned with conservation, historic preservation, community development and economic development will find the guide useful as we address:

How do local communities, economies and environments function?

What makes them healthy?

How can we assess their condition?

How can we devise strategies to achieve healthy communities, economies and environments?

How do we get started?

How can we measure our success?

Ultimately, the guide explores ways to build on the strengths of a local community to achieve the goals of its citizens. It presents the lessons learned from several places where people have found that environmental protection can go hand-in-hand with a prosperous economy. They have learned that economic development is local and that they can look inside their community for leadership and new opportunities. Overwhelmingly, people in these places agree that a high quality of life depends on the quality of all three elements -- the local community, economy and environment.

To demonstrate these principles, the guide closely examines one extraordinary place -- Virginia's Eastern Shore -- that offers an outstanding example of community efforts to preserve a significant natural landscape while providing for the economic needs of its citizens.

The guide features case studies from other communities where the Center for Compatible Economic Development is working: the Clinch Valley in Virginia's Southwestern mountains and the ACE Basin in coastal South Carolina; as well as a bibliography and sources of more information.

We hope the guide offers the tools and inspiration for you and others to work toward a successful and sustainable future. By sharing information about the tightly interwoven web of community, economy and the environment, we hope especially that people who have focused previously on just the environment or just economic development will come to the conclusion that their future lies in addressing these goals together.

The guide will always be a work in progress. We welcome your suggestions and hope you will share with us and others the lessons learned in your community.

We begin the handbook with the story of the Virginia Eastern Shore.

CASE STUDY - VIRGINIA'S EASTERN SHORE

Scanning the horizon on the Virginia Eastern Shore, it's not hard to image the verdant new world Captain John Smith encountered in his explorations of the Chesapeake region. From the salt marsh -- a sea of green-gold cordgrass laced by twisting tidal creeks -- a look seaward takes in the low hummocks and sandy knolls of the barrier islands. The view inland reveals a vast unbroken woodland rising from the marsh, punctuated by stretches of open water.

The seaside of the Eastern Shore is the last broad expanse of coastal wilderness left on the crowded East Coast and contains one of the most outstanding examples of a naturally functioning coastal environment. The unsullied landscape looks much the same from the water as it must have hundreds of years ago; a narrow finger of land interlaced by coastal creeks and encompassed by bays and marshes.

Environmental Significance

The Shore extends south from the Maryland-Virginia Border to the mouth of the Chesapeake Bay and is edged by a 60-mile chain of offshore islands. The sandy beaches, maritime vegetation and rich salt marshes provide habitat for one of the highest concentrations of nesting shorebirds on the Atlantic Coast.

The coastal bays and wetlands landward of the islands comprise the finest marsh lagoon system on the Atlantic Coast as well. Marshes and mudflats provide critical habitat for migratory shorebirds, seabirds and wading birds.

Moreover, the narrow strip of shoreline forests on the mainland near the Shore's southern tip provide one of the two most critical staging areas on the East Coast for neotropical songbirds and raptors during the fall migration.

These extraordinary natural resources have been the focus of intensive conservation efforts for nearly 20 years.

While the islands and marshes have remained wild and unspoiled, people have for millennia reaped the bounty on the Eastern Shore. The place names -- Accomack, Wachapreague, Nassawadox - pay tribute to the native Americans whose ancestors roamed the shore more than 10,000 years ago. Generations of watermen have set out at dawn to harvest the sea. The mainland fields have been tilled since before the Revolutionary War, when the peninsula was the breadbasket of Colonial America.

Socioeconomic Conditions

Nearly 45,000 people live in the two counties on the Virginia Eastern Shore -- Accomack to the north and Northampton to the south. The region remains largely

agricultural with small towns, villages and settlements that share strong cultural and historic ties to the sea and the land. For nearly 300 years, watermen and seaside farmers have relied on the Shore's rich natural resources for their livelihoods; harvesting clams, oysters, crabs, fish and a variety of crops.

But today, Eastern Shore communities are under tremendous economic stress. Northampton County ranks 132 out of 136 Virginia counties and cities in per capita income (average $6,436). One third of the African-American population (which is 40 percent of the total) and one seventh of the white population live at or below the poverty level; the Eastern Shore's poverty rate is twice the national average.

In just three years, three local seafood and vegetable packing and processing plants shut down, forcing over 200 people out of their jobs, most of them black women working to support their families. At the same time, Northampton County confronted economic development proposals that would have dramatically impacted the region's pristine natural environment -- a major plant to treat contaminated soils shipped from northern states, a maximum security prison and a central sewage treatment plant that would discharge directly into clean tidal waters.

Northampton's citizens, reflecting a pride of place and sense of self-determination, ultimately rejected development plans that threatened their region's environmental quality. Instead, citizens embarked on a ground-breaking effort to collaborate with each other and with conservationists, business people, economic and community development professionals and local government officials to plan for a sustainable future.

Conservation Approaches

Twenty years ago, the greatest threat to the Virginia Eastern Shore environment was potential destruction of the unsullied natural habitat on the barrier islands by waterfront resort and residential development, a pattern that has engulfed much of the Atlantic Coast. Today, this threat has largely been eliminated. Since 1970, all or part of 14 barrier islands have been acquired by The Nature Conservancy to form the Virginia Coast Reserve, a total of 45,000 acres. Federal or state managed wildlife refuges have been established on other islands as well.

The barrier islands are just one component of the Eastern Shore's much larger ecological system. The incredible diversity of birds and marine life in the region is dependent on the health of coastal waters and marshes. In turn, these waters and marshes are affected by the human activities on the mainland. This realization demands a much larger and more complex conservation initiative than the traditional purchase and management of the most sensitive lands.

From this perspective, the primary threat to the region today lies in inappropriate

resort and residential development on the mainland shoreline. Intensive development degrades the water quality on which fisheries and wildlife depend by overloading coastal waters with nutrients, which produces too much algae, which kills marine life. Clearing, cutting, paving and building permanently destroys habitat vital to migratory birds and other wildlife.

The Nature Conservancy launched a major effort in 1985 -- the Seaside Farms Conservation Easement Program -- to protect mainland natural areas through the purchase and resale of strategic waterfront properties. Careful studies gauged the degree of residential and other compatible uses that could take place with little to no impact on the adjacent natural systems. Conservation easements were placed on each property to permanently restrict the type and extent of future development. The properties are now being resold. The ongoing Seaside Farms Program demonstrates an economically-viable, low-density alternative to traditional waterfront development, while maintaining agriculture production, access to the waterfront and other compatible uses.

Community Efforts

As the Conservancy's Seaside Farms Program got underway, community interest in pursuing other opportunities for compatible economic development was growing as well. In 1987, people from all sectors of the community came together to form a new group, Citizens for a Better Eastern Shore (CBES), to preserve the region's rural character and natural resources while promoting economic opportunity. One of CBES's first projects was to help develop a sound Northampton County comprehensive land use plan to guide future development.

The goals of the adopted plan clearly reflect the community's values. It seeks to

conserve the county's natural resources,
preserve the county's rural character and lifestyle,
secure economic sufficiency for all citizens,
provide adequate public services for all citizens, and
support agriculture, tourism, seafood and light industry as the county's major industries.

Community efforts also led to the creation of the Northampton Housing Trust, a professionally-staffed, local organization devoted to providing affordable housing. CBES, the local NAACP, the local Farm Bureau and others worked together to secure an interim zoning ordinance that better protects natural resources and provides affordable rural house lots for local people. Also, the citizens of the tiny Northampton village of Willis Wharf launched a small scale community planning

process, which led in turn to the creation of ongoing working groups and an annual Waterman's Festival on the waterfront.

Economic Development Initiatives

To directly address the economic needs of the community, CBES, the NAACP and The Nature Conservancy, in 1991, organized the Northampton Economic Forum, a broadly-based, collaborative effort that includes representatives from all sectors of the community. The forum's emphasis on compatibility is reflected in its motto: "Ensuring Our Future -- Preserving Our Heritage."

For 12 months, more than 100 Northampton County residents worked on a plan to prepare the county and the Eastern Shore for the future. They attended a one-day retreat, numerous task force meetings and review sessions as part of a planning process sponsored by the forum and funded by the Ford Foundation, the Virginia Center for Rural Development, The Nature Conservancy and local contributors.

The planning process sought to help local leaders find and sustain the community's competitive edge by assessing Northampton County's strengths and weaknesses, the county's principal competitors and collaborators, and the opportunities and threats posed by global economic changes. A series of direct strategies was created to build on the region's assets and promote more widely-shared and sustainable economic development. Forum leaders are now implementing these action steps.

The results have been remarkable. Efforts to develop the seafood and aquaculture industry triggered expansion from one company in 1991 to four in 1995. Sales of clams rose from less than $1 million to more than $4 million per year, with projections of up to $11 million in sales by 1997. At the same time, a new zoning ordinance was drafted to protect the water quality on which the industry depends by clustering residential development, preserving vegetation and minimizing runoff.

Efforts to protect natural and cultural assets and develop the heritage tourism industry garnered a $740,000 federal grant to create a Northampton County Heritage Trail tour and interpretative program. Another new project is the Eastern Shore Birding Festival, held at the height of the Fall migration. The first year, festival visitors spent $52,000 locally, which doubled to $112,000 the second year.

A $2.9 million Enterprise Community federal grant for rural development is being used by the Virginia Eastern Shore Economic Empowerment & Housing Corporation to provide better housing and economic opportunities in the region. Among other initiatives, VESEEHC developed a transitional housing facility in the hamlet of Birdsnest as one part of a multi-tiered plan to provide housing, job training and other support services to the community.

Officials of Northampton County and the Port of Cape Charles spearheaded the development of a Sustainable Technologies Industrial Park two years ago and secured a Swiss solar cell manufacturer as the first tenant. The President's Council on Sustainable Development named the park in 1995 as a national model of resource efficiency and pollution prevention.

The Virginia Eastern Shore Sustainable Development Corporation was formed by The Nature Conservancy and private investors in September, 1995 to demonstrate further ways to protect the environment, while creating jobs for local residents and earning a reasonable profit for investors. The Corporation, capitalized at $2.7 million, develops, licenses and markets compatibly-produced products that capture the region's culture, traditions and natural resources. It also manages an Eastern Shore Venture Fund to provide short term business loans, loan guarantees and venture capital to local enterprises that are ecologically compatible.

The Corporation is helping Eastern Shore farmers forge working relationships to supply urban grocery stores. It assists bed and breakfast owners in exploring and expanding the market for heritage and nature tourism experiences. The Corporation is launching a program to market Eastern Shore products and crafts through mail order and retail stores.

Local staff have estimated that the emphasis on sustainable development in Northampton County generated roughly $17.5 million in new federal, state, local and private funds in the past five years.

Community, Economy, Environment

The Virginia Eastern Shore represents a pioneering effort -- by a poor rural community -- to plan and reach for a prosperous, sustainable future. This future includes a healthy community, a healthy economy and a healthy environment -- a future which is beautifully reflected in the mission statement of the Northampton Economic Forum:

Achieving a New Vision of Progress

Building a diverse, prosperous, and self-reliant economy that provides good jobs for all citizens.

Preserving the globally-significant natural resources, character, history and culture, and quality of life that are Northampton's special strengths.

Improving the lives of all citizens with good homes, schools and services.

Creating a world model community.

The vision of the Eastern Shore is a future to which all communities can aspire.

CASE STUDY - THE CLINCH VALLEY OF VIRGINIA

The Clinch Valley encompasses the watersheds of the Clinch, Powell and Holston rivers, extending more than 2,200 square miles across the Appalachian mountains in southwest Virginia and northeast Tennessee. The Virginia sections of the Clinch and Powell rivers are the only remaining undammed tributaries of the once-expansive Tennessee River system.

Environmental Significance

These watersheds support the highest concentration of globally-rare and federally-endangered species in the continental United States and boast an unparalleled biological diversity. More than 400 rare plants and animals, 30 of which are listed for federal protection, thrive here.

The region's rivers provide habitat for 16 species of rare fish, such as the yellowfin madtom, and are the sole remaining sanctuary for an embattled collection of freshwater mussels living nowhere else on earth. Once there were nearly 60 species of mussels here; the number has now dwindled to around 40, of which 26 are globally rare.

The Clinch Valley also supports highly productive hardwood forests, as well as grazing and crop lands along the river corridors. The extraordinary beauty of the cold, clean rivers, forested mountains and granite outcroppings is another celebrated, and locally valued, aspect of the region's natural resources.

Major Threats

While stresses from varied sources threaten the natural elements and ecosystem processes in the region, the following threats have been identified as having the critical potential impacts on the priority natural systems:

Contaminants from active and abandoned coal mines;

Sedimentation from clearcutting and inappropriate forestry practices;
Sedimentation from livestock grazing along streambanks.

The critical threat to the long term health of the region's free-flowing rivers and globally-rare aquatic species is clearcutting of hardwood forests and the accompanying loss of water quality caused by sedimentation and erosion.

The overuse of clear-cutting poses a substantial threat to the region's long-term community and economic health. Clinch Valley residents consistently oppose the practice in community forums and polls. Clear-cutting also represents a one-shot economic boost, offering little on which to build a sustainable economic future.

Socioeconomic Conditions

The region suffers from poor economic performance, low educational attainment and high levels of poverty. With unemployment rates as high as 19 percent, more than twice the state and national average, local residents have few opportunities and little hope for the future. Only half of the adult residents have graduated from high school. Personal and family income is nearly one-third less than the national average.

The main economic force in the Clinch Valley is the coal industry. More than 40 percent of Virginia's coal is produced by five counties within the region. Although coal production increased between 1980 and 1988, the need for coal workers decreased over the same period.

Currently, more than 40 percent of the labor force in the heart of the region is employed in the coal industry. During the past 15 years, however, more than 35 percent of coal miners have lost their jobs as the industry downsized and technology improved. With coal supplies expected to last for only another 10 to 30 years, a major local coal company positioning itself for bankruptcy, and up to 50 percent dependence on revenues from coal-related jobs, the region is facing fundamental economic changes.

Another regional economic activity, farming, has historically been a critical component of the social and economic fiber of the region. Nearly 35 percent of the land in the Clinch and Powell river basins is devoted to agriculture. Beef cattle and Burley tobacco are the primary commodities. Like coal, the tobacco industry faces fundamental changes. Tobacco farmers have experienced a 20 percent cut in allotments over the past two years, yet few farmers have been able to find agricultural alternatives with a dollar-return that is comparable to tobacco.

A few new manufacturing firms have been recruited into the region. But the newly

created minimum wage jobs in the factories cannot make up for the loss of mining jobs that paid an average of $20 an hour.

The poor and deteriorating economic conditions in the region are likely to increase the pressure to generate new and increased income from the region's forests.

Conservation Programs

The Nature Conservancy established the Clinch Valley Bioreserve project in 1989 and has joined more than 50 active partnerships with local citizens, commu-nity organizations, businesses and agencies in the Clinch Valley, all with a mutual goal of creating a vision for the future that combines conservation with job development.

Conservation efforts in the region include:

Land Acquisition. Beginning in 1984 with the Pendleton Island Preserve (habitat for rare mussels), the Conservancy established five nature preserves representing all of the region's rare species and natural systems. Most recently, the Conservancy helped protect The Pinnacle, a rugged tract on the Clinch River in Russell County which provides habitat for 12 rare plants and 11 rare mussels. The Pinnacle is now part of the state natural area preserve system. While these efforts are important, land acquisition alone cannot address the major threats to aquatic systems and species.

Land Registry. Working with the Cave Con-serv-ancy of the Virginias, the Virginia Cave Board, and the Virginia Division of Natural Heritage, the Conservancy has registered 17 of the region's biologically-significant caves. Registry -- voluntary agreement by landowners to protect caves on their property -- ensures careful manage-ment of habitat for 11 globally rare species, including the endangered gray bat.

Streamback Restoration. Teaming up with local farmers, the U.S. Fish & Wildlife Service, the Tennessee Valley Authority, and the Virginia Division of Soil and Water Conservation, the Conservancy installed seven miles of fence to keep cattle, an economic mainstay in the region, out of the Clinch and Powell rivers. Conservancy staff worked with more than 50 local farmers in this incentive-based program to establish alternate sources of water for the cattle, increase farm income, conserve soil and restore native vegeta-tion to the streambanks.

Science. Local universities and agencies provide vital information about rare species, water quality, hydrology and habitat restoration issues. These agencies, working with the Conservancy, are involved in nearly a dozen research efforts to

understand the complex life histories of endangered organ-isms and develop innovative methods to aid in the recovery of these species. Research also seeks to quantify threats to the health of rivers and caves and find ways to reduce these threats without hurting the economy. The U.S. Environmental Protection Agency has selected the Clinch and Powell rivers as a pilot site for its innovative Ecological Risk Assessment project. The results will help conservation partners develop an integrated protection plan for the entire watershed.

Community Outreach. A crucial element for success in the Clinch Valley is its people. A 1994 Conser-vancy poll found that nearly 75 percent of local residents felt they should rely upon their own abilities, rather than those of "outsiders," to effect changes in their commu-nity. Conservancy staff and others are making great strides in involving local residents -- educating them in the impor-tance of protecting biological diversity, training them in methods of protecting natural resources on their own property and helping to establish grassroots efforts toward enhancing the environmental and economic vitality of their area.

Sustainable Development. Protecting the ecological processes of entire watersheds is impossible without considering how the region's natural resources sustain the human economy. Local communities will not join in conservation efforts unless their econo-mies can grow and prosper. Meeting this challenge means fostering sustainable develop-ment initiatives throughout the region.

Compatible Economic and Business Development Opportunities

The recent public opinion poll in the region shows strong citizen knowledge and support of a compatible, sustainable approach to natural resource conservation and economic development. More than 70 percent of local citizens support planned growth and job creation in their community, as long as natural resources, family farms and their Appalachian culture are protected.

The Clinch Powell Sustainable Development Initiative, a regional consortium of community groups, small businesses and public agencies, was formed in 1993 to write a strategic plan for sustainable, locally-based development for 11 counties in Southwest Virginia and eastern Tennessee. The plan focuses on sustainable wood products, agriculture and nature tourism.

To create a local model for the Clinch Valley, citizen leaders in Russell County joined with the Chamber of Commerce, the regional Planning District Commission, local government and The Nature Conservancy to launch a community-based strategic planning effort. Russell County is traversed by the Clinch River and features exemplary natural areas that offer a good base for nature-based tourism. It also represents a cross section of the region's economic challenges, including the coal and tobacco industries.

The strategic planning group, named the Russell County Visioning Forum, is in the process of hiring a facilitator to help conduct a series of local community meetings and generate citizen involvement in an assessment of social and economic conditions, industry analyses and consideration of the area's comparative strengths and weaknesses. Through this community-based process, local residents will be able to define a vision for their future and that of Russell County.

The Nature Conservancy and the Center for Compatible Economic Development are helping the Russell County Forum and the Clinch Valley Sustainable Development Initiative create business plans to implement the community-based strategic plan. Others in this effort include Old Dominion University's Entrepreneurial Center , Virginia Polytechnic Institute, North American Resource Management, Inc. and Mater Engineering.

Some promising sustain-able economic development opportunities in the Clinch Valley include:

Forestry and Wood Products. Extensive hardwood timber resources and excellent forest growing conditions in Southwest Virginia represent the region's greatest long-term comparative economic advantage. Demand continues to rise for furniture-grade Appalachian hardwood. While local residents are generally opposed to clear cutting and prefer less environmentally destructive methods, timber harvesting is expected to increase as the region's economy continues to decline.

To provide an alterna-tive to clearcutting, several conservation partners are promoting an environmentally sensitive draft horse logging enterprise (draft horse logging has been shown to work on a large scale in other areas). Trees to be harvested are carefully selected, felled and carefully removed from the forest using draft horses rather than heavy machinery, thereby reducing environmental impacts.

The goals of the horse logging project are to create jobs and pro-vide train-ing for un- employed loggers, as well as to add value to local timber (and create even more local jobs) through local processing, production and marketing of certified wood products, which will be sold at premium prices. Next steps include market exploration, feasibility assess-ment, and a sophis-ticated business plan.

Nature Tourism. The Clinch Valley lies in the midst of rugged mountains and striking scenery. Combined with the rich Appalachian culture and history, the region has enormous potential to attract visitors and stimulate economic develop-ment.

Russell County residents, for example, hope the 200-acre Pinnacle Preserve will serve as a draw for visitors with its panoramic views (the pre-serve is surrounded by two state-designated scenic rivers), fishing, hiking trails and other outdoor activities. The local nature tourism program plans to create busi-nesses that offer

value-added interpretive services, maximize local spin-off businesses such as bed-and-breakfasts, and spawn other opportunities to preserve and promote the region's natural resources.

In Scott County, the Dungannon Development Commission, a non-profit community group that promotes housing rehabilitation and economic diversification, has leased Rikemo Lodge on the Clinch River. The commission plans to operate the 400-acre former hunting preserve as a conference and retreat center that will offer nature and heritage tourism programs.

The Russell County forum is working with local citizens, the Coalfield Regional Tourism Authority and the Small Business Develop-ment Center to identify nature-based tourism business opportunities and entre-preneurs. One prospect is Land and Water, Inc., a local non-profit guide service that plans to train and equip local residents for new small nature tourism businesses. The Conservancy and other partners will provide follow-up assistance for business planning and development.

Coal Re-mining. Currently, there are over 70,000 acres of abandoned mine lands (AMLs) in Southwest Virginia. Many of these older AMLs, which were "grandfathered" from reclamation, cause substantial toxic pollution of nearby streams and rivers. Because mining technology has improved since coal was extracted from some mines, it is now economically feasible to go back and "re-mine" previously mined lands (considered AMLs), which then must be reclaimed under federal law.

Following appropriate research, many sites may be good candidates for environmental improve-ment through re-mining, while also creating opportunities for sustained uses such as agriculture or forestry. The Powell River Project, supported by the coal industry, government agencies and other groups, is investigating reclamation techniques and productive uses for reclaimed land in seven counties of southwestern Virginia.

As a first step, The Nature Conservancy approached several coal companies, state and federal agencies, and local residents to seek innovative solutions to AML problems. They plan to: assess the potential for environmental improvements, the economic benefits, and any necessary regulatory or legislative changes; conduct a rigorous study to determine the biological and water quality impacts of abandoned mine lands; and establish a demonstration re-mining/reclamation project in a selected small watershed, to determine its feasibility on a wider scale.

CASE STUDY - THE ACE BASIN OF SOUTH CAROLINA

The 350,000 acres within South Carolina's ACE Basin, (named for the Ashepoo, Combahee and Edisto Rivers) represent one of the last intact wetland ecosystems in the Eastern United States. The three rivers flow through portions of four Lowcountry counties -- Charleston, Colleton, Beaufort and Hampton -- to reach the St. Helena Sound estuary. However, the core natural areas and key buffer lands lie primarily in Colleton County.

Environmental Significance

The ACE Basin is considered a "world class" ecosystem, internationally regarded as a priority region for habitat protection. This recognition is due to an extraordinary diversity of habitat types, biologically rich fish and wildlife populations, the presence of important endangered and threatened species, its role as a major stopover point for birds on the Atlantic Flyway and its strong conservation partnerships designed to protect these resources.

The region is remarkably undeveloped; distinguished by broad expanses of salt, brackish and freshwater marshes and towering stands of native pine forests. Blackwater rivers flow past bottomland hardwood forests. Old rice fields and tidal impoundments are filled with dozens of species of wading birds and waterfowl.

The basin's coastal islands, marshes and forested wetlands and uplands support 33 types of natural plant communities and provide critical habitat for eight rare and endangered wildlife species, including the Southern bald eagle, wood stork, shortnose sturgeon and loggerhead turtle.

The very high environmental quality and renewable natural resources of the region provide important economic benefits, with income generated by: commercial fisheries and sport fishing; extensive timber resources, primarily from pine species; and recreation, including hunting and nature-based tourism.

Major Threats

The ACE Basin lies between the Lowcountry's fastest-growing resort and residential communities -- the city of Charleston and Kiawah and Seabrook islands to the north and the city of Beaufort and St. Helena and Hilton Head islands to the south. The populations in these areas have nearly doubled in the past decade.

Such intensive residential and resort development poses the critical threat to the diverse natural habitats and natural processes in the ACE Basin. Cutting and clearing for development threatens the integrity of mature maritime forests on the coastal islands, while new road and bridge construction threatens the natural flow of water in the tidal marshes. The loss of shrub layers in the forest and on the

waterfront would eliminate a primary filter of upland contaminants. Increases in the number of septic drainfields, new docks and marinas, and recreational boat traffic also threaten the region's pristine water quality.

Secondary threats to the ACE Basin stem from inappropriate forestry practices. Large scale conversion of diverse native forests and other plant communities to pine monoculture threatens the wide range and health of habitats, while erosion and sedimentation associated with clearcutting in bottomland hardwood and other forests threatens to degrade water quality.

These environmental threats represent long-term impacts for the region's community and economy, as well. Waterfront development separates local fishermen, boaters and other residents from access to the water for traditional activities. Weavers of Lowcountry sweetgrass baskets, a prime source of income for many minority families, face diminishing sources of the native grass. An increasing number of shellfish beds have been closed to commercial and recreational harvesters due to the loss of water quality.

Socioeconomic Conditions

Two-third's of the ACE Basin lies in Colleton County, where per capita income falls into the bottom fifth of all U.S. counties. Like so many rural areas, poverty rates are high and have worsen in the past decade. Also, educational attainment is low and job opportunities are stagnant.

There are broad economic disparities between African-American and white residents. African-Americans, who comprise 45 percent of the county's population, suffer from much higher poverty and unemployment rates and earn about half the annual income of whites in Colleton County.

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